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10/770,919

02/03/2004

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MICS:0078-5

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7590

02/22/2006

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EXAMINER

BLUM, DAVID S

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 02/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/770,919

Applicant(s)

COBBLEY ET AL.

Examiner

David S. Blum

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 3,4 and 16-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 5-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-21 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>2/3/04</u> . | 6) <input type="checkbox"/> Other: _____ |

This is in response to the election filed 11/28/05.

Election/Restrictions

1. Applicant's election without traverse of the species of claim 2 in the paper filed 11/28/05 is acknowledged.
2. Claims 3-4 and 16-21 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the paper filed 11/28/05.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Stewart (US 4,589,547).

Stewart teaches the device of claim 1 in that a holder (carrier) having a plurality of stack die is adapted to temporarily hold the plurality of die stacks (column 2 lines 32-37 and column 3 lines 34-38, 65-66, a stack of die reads on a plurality of die stacks).

Regarding the recitation "being adapted" this is a product by process limitation and is given no patentable weight.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stewart (US 4,589,547) in view of Pai (US 6,503,776).

Stewart teaches the apparatus of claims 5 and 7-9 as recited above in regard to claim 1, except for the die stacks comprising two die.

Regarding claim 5, Stewart teaches a holder for transporting electronic devices, especially stacks of semiconductor die and the like. This broad teaching encompasses individual die in stacks (column 3 lines 65-66) as well as more complete devices. One skilled in the art at the time of the invention would know that this includes individual stacks of die. Pai teaches a die arrangement that is a stack of two die, each die coupled together by an adhesive.

Regarding claim 7, Pai teaches a stack where the topside surface area of one die is less than the topside surface area of another die.

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Regarding claim 8, Pai teaches a die (chip 130) that over hangs a die (chip 160, figure 8) and as described in the instant specification, that reads upon a shingle stack.

Regarding claim 9, Stewart teaches memory chips (column 9 line 30) as does Pai (column 1 line 19).

It would be obvious to one skilled in the requisite art at the time of the invention would modify Stewart to include die stacks as taught by Pai, that the broad teaching of die to finished devices would include die stacks.

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stewart (US 4,589,547) in view of Pai (US 6,503,776) and in further view of Hakey (US 6,627,477).

Stewart teaches the apparatus of claim 6 as recited above in regard to claim 5, except for the one of the two semiconductor die being thicker than the second of the two die.

Pai (abstract) teaches that a die stack may comprise die (or chips) that serve different operations. Pai teaches combining chips of processor, memory, and associated logic into a single package (column 1 lines 17-19) and that a stack is a preferred type of package. Although not teaching that these chips have a different thickness from each other, one skilled in the requisite art at the time of the invention would know this. Hakey does not stack the die, but also connects die of logic chips and memory chips and

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teaches that these die have different thicknesses (column 2 lines 34-40), thus confirming that one skilled in the requisite art at the time of the invention would know that the chips of Pai could be of different thicknesses. In a stack of two die of different thicknesses, it is inherent that one die is thicker than the other die.

It would be obvious to one skilled in the requisite art at the time of the invention would modify Stewart and Pai to include die of different thicknesses as Hakey teaches the different die of Pai would have different thicknesses.

8. Claim 1-2, 10-11 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wood (US 5,145,099) in view of Pai (US 6,503,776).

Wood teaches the apparatus of claims 1-2, 10-11 and 13-15 except for explicitly stating the die may be die stacks.

Regarding claim 1, Wood teaches a holder (tape reel column 4 lines 2-3) for temporarily holding a plurality of die. The die include multichip modules (column 4 line 3). Although not explicitly reciting "die stacks", multichip suggests die stacks. Pai teaches a die arrangement that is a stack of two die , each die coupled together by an adhesive.

Regarding claim 2, the holder is a tape reel (column 4 lines 2-3).

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Regarding claim 10, wood teaches a tape reel (column 4 lines 2-3) for temporarily holding a plurality of die. The die include multichip modules (column 4 line 3). Although not explicitly reciting "die stacks", multichip suggests die stacks. Pai teaches a die arrangement that is a stack of two die .

Regarding claim 11, Pai teaches a die arrangement that is a stack of two die , each die coupled together by an adhesive.

Regarding claim 13, Pai teaches a stack where the topside surface area of one die is less than the topside surface area of another die.

Regarding claim 14, Pai teaches a die (chip 130) that over hangs a die (chip 160, figure 8) and as described in the instant specification, that reads upon a shingle stack.

Regarding claim 15, Wood teaches die and semiconductor devices, thus teaching a broad scope of chip type without explicitly reciting memory chip. Pai (column 1 line 19) teaches the stack may include memory chips.

It would be obvious to one skilled in the requisite art at the time of the invention would modify Wood to include die stacks as taught by Pai, that the broad teaching of die to finished devices would include die stacks.

9. Claim 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wood (US 5,145,099) in view of Pai (US 6,503,776) and in further view of Hakey (US 6,627,477).

Wood teaches the apparatus of claims 12-13 except for the one of the two semiconductor die being thicker than the second of the two die.

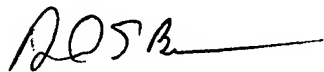
Pai (abstract) teaches that a die stack may comprise die (or chips) that serve different operations. Pai teaches combining chips of processor, memory, and associated logic into a single package (column 1 lines 17-19) and that a stack is a preferred type of package. Although not teaching that these chips have a different thickness from each other, one skilled in the requisite art at the time of the invention would know this. Hakey does not stack the die, but also connects die of logic chips and memory chips and teaches that these die have different thicknesses (column 2 lines 34-40), thus confirming that one skilled in the requisite art at the time of the invention would know that the chips of Pai could be of different thicknesses. In a stack of two die of different thicknesses, it is inherent that one die is thicker than the other die.

It would be obvious to one skilled in the requisite art at the time of the invention would modify Wood and Pai to include die of different thicknesses as Hakey teaches the different die of Pai would have different thicknesses.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Blum whose telephone number is (571)-272-1687) and e-mail address is David.blum@USPTO.gov .

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr., can be reached at (571)-272-1702. Our facsimile number all patent correspondence to be entered into an application is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David S. Blum

February 21, 2006